من ذكريات العمل

قناطر نجع حمادى الجديده

مشكلة البيزوميتر B10

وصف المشكلة

يوم 11 سبتمبر 2004 اثناء اعمال الانشاء في مشروع قناطر نجع حمادى الجديدة وحوالي منتصف الليل واثناء اعمال الحفر داخل حفة الانشاء (Construction Pit) في منطقة الهويس وعند الوصول الى منسوب الحفر (53.00) حدث اندفاع للمياه على هيئة نافورة بقطر من 10الى 15 سم تقريبا وهو ما سبب الكثير من القلق والخوف عن السبب هل تم اختراق طبقة الغير منفذه من الطين الصلب ال (Hard Clay) ام هل هناك مشكلة فى الستارة المؤقتة ام ماذا ...وكان كل الخوف ان يتسبب هذا في تعطل العمل بالمشروع.

ولإعطاء صورة مبسطة عن ظروف موقع العمل

موقع العمل عبارة عن حفرة الانشاء (Construction Pit) وتشمل منشآت المشروع من محطة الكهرباء والمفيض والاهوسة الملاحية محاطة بسد مؤقت (Coffer Dam)بداخله ستارة من الخرسانة البلاستيكية (Cut-off wall) تصل الى طبقة طينية غير منفذة (Hard Clay Layer) وذلك لحماية المشروع اثناء فترة الانشاء من تسرب المياه سواء من الجوانب او القاع ويبلغ طول السد المؤقت حوالى 2 كيلومتر ويبلغ ارتفاع الستارة المؤقته حوالى 50 مترا.

منسوب الطبقة الغير منفذه حوالي 21.50 وسمكها حوالي 10 أمتار

التربة في الموقع تتكون من طبقات رملية وحصوية (Pleistocene) مع وجود طبقات طينية وسلتية (Silt and Clay) ، مما يسمح بسهولة انتقال المياه عبر الطبقات الأكثر نفاذية إذا لم يتم إغلاق المسار بشكل صحيح

ومن هنا كان التخوف عن سبب اندفاع المياه في هذا الحجم الهائل من الحفر

واتذكر تماما مكالمة المهندس الاستشاري المقيم "مستر هاين" من لامايز الساعة الواحدة صباحا وهو مضطرب ووصلت الموقع ووجدت كل مسئولي المقاول والاستشاري في الموقع مما ينبئ على أهمية المشكلة وخطورة الوضع.

وكان الاستشاري قد اصدر تعليماته:

- إيقاف اعمال الحفر في هذه المنطقة
- ردم وتعلية مكان الفتحة بكميات كبيرة من التربية الزلطية (حصى ورمل) حتى منسوب (57.00) لزيادة الوزن عن ال up-lif حتى تم إيقاف اندفاع المياه بعد ان استمرت حوالى النصف ساعة.

في اليوم التالى قام 12-09 قام فريق المساحة برفع موقع البئر ووجد انه مطابق لإحداثيات موقع جسه قديمة ضمن الآبار التي تم استخدامها في اعمال دراسة أبحاث التربة المشروع Geo Technical)

(Investigation الذى قامت به شركه مصر ريموند سنة 2000 تحت اشراف الاستشاري لامايز وكانت ضمن غدد 23 بئرا استكشافيا منهم 11 بئرا على الشاطئ on shore و12 بئرا داخل المياه off shore .

بعد دراسة المشكلة اصبح من المرجح جدًا أن السبب الرئيسي لاندفاع المياه أن هذه البئر (B10) لم تحقن بكامل الطول وانه ومع استمرار الحفر حتى وصل الى منسوب 53.00 وهى الدرجة التي تعادل فيها وزن التربة مع ال (up-lift) وعند زياده الحفر عن هذا المنسوب زاد ال uplift عن وزن التربة المكافئ مما سبب اندفاع المياه .

ولمعالجة الموقف بسرعة تم الاتي:

- إيقاف اعمال الحفر في هذه المنطقة
- ردم وتعلية مكان الفتحة بكميات كبيرة من التربية الزلطية (حصى ورمل) حتى منسوب (57.00) لزيادة الوزن عن ال up-lif حتى تم إيقاف اندفاع المياه.
- العمل بحرص شديد في اعمال الحفر في أماكن الجسات السابقة
- الاتصال بشركة مصر ريموند التي قامت بعمل الجسات لمعرفة اية بيانات اضافية عن أسلوب حقن هذه البيزومترات والمواد المستخدمه.
- عمل دراسة شاملة على جميع الابار التي تم عملها.

اقترح الاستشاري لامايز ثلاثة حلول رئيسية لحل المشكلة وهى:

الأول : إعادة الحفر والردم والحقن :(Re-drilling and Grouting)

إعادة حفر البئر القديمة وإعادة الحقن من مستوى (63.00 متر) باستخدام أنبوب بقطر 150 مم، ثم إدخال أنبوب للحقن لردم البئر.

وتتميز هذه الطريقة بانها تستهدف المشكلة مباشرة عبر إغلاق القناة المفتوحة كما انها اقل تكلفة.

ومن مخاطر هذه الطريقة انها قد لا تتبع المسار القديم وعدم التنبؤ الكامل بنتائج العملية لاحتمال وجود معوقات وقد يستلزم الامر في النهاية حفر بئر أخرى إضافية.

الثانى : التعامل مع وجود البئر Instalation of a well

تركيب بئر مزودة بفلتر حتى يتم تفادى ان تُغسل الجزيئات الدقيقة وتركيب خزان فوق الفتحة للتحكم في تدفق المياه ونقلها خارج منطقة الأساس، مع إمكانية ردم البئر لاحقًا بعد إنشاء الأساسات.

ويتميز هذا الحل انه يوفر حلا مؤقتا سريعا ويسمح باستئناف الاعمال ويمكن استخدام المياه المندفعة في اعمال الانشاء الا انه من مخاطر هذه الطريقة احتمال تسرب الجزيئات الدقيقة إذا لم يكن الفلتر فعالا كما يتطلب عمل منصة كبيرة على منسوب 61.00 واعمال ترابية ضخمه.

الثالث: تركيب سدادة خرسانية: Installation of a Concrete Plug

ويتم ذلك بعمل فتحة بقطر 80 سم إلى عمق حوالي 40.00 متر باستخدام معدة مقاول اعمال الحقن Bauer BG15، ثم ملؤها بالخرسانة لإغلاق التسرب والمنطقة المحيطة بها

الا ان هذا الحل استبعد لان معدات الشركة الموجودة في الموقع لا تتناسب مع هذا النوع من الاعمال كما ان خطر التسرب قائما بالإضافة الى ان اعمال الحفر والخرسانة مرتفعة.

وفى النهاية تم اختيار الحل الأول (إعادة الحفر والردم والحقن) كخيار مفضل من قبل جميع الأطراف.

خطوات العمل:

تم اقتراح قاعدة خرسانية مسلحة سابقة التجهيز بأبعاد 1.5م*1.5م*0.3 م (وزن حوالى1.7 طن) مزودة بماسورة قطر 15سم توضع فوق فتحة البئر مصدر المياه عند منسوب (53.00)

يتم لحام الماسورة مع جزء اخر بنفس القطر حتى منسوب 59.00 وبذلك يكون طول الماسورة الكلى 9 امتار 6+3 اسفل القاعدة الخرسانية.

تم عمل فتحات تهويه على امتداد طول الماسورة بفتحات كل متر

تم استكمال الردم حول منطقة التسرب وفوق القاعدة بعد التأكد من مطابقة الماسورة لفتحة البئر. حتى منسوب 63.00 متر

تم حقن البئر بمخلوط الاسمنت والبتونيت بنسبة 1:1.5 بماسورة قطر 7.5 سم حتى الطبقة الغير منفذه (Hard Clay Layer) بعمق حوالى 37 مترا من منسوب (63.00) عن طريق هذه الماسورة باستخدام معدة الحقن (Bauer UBW 7”).

بلغت كميات الحقن

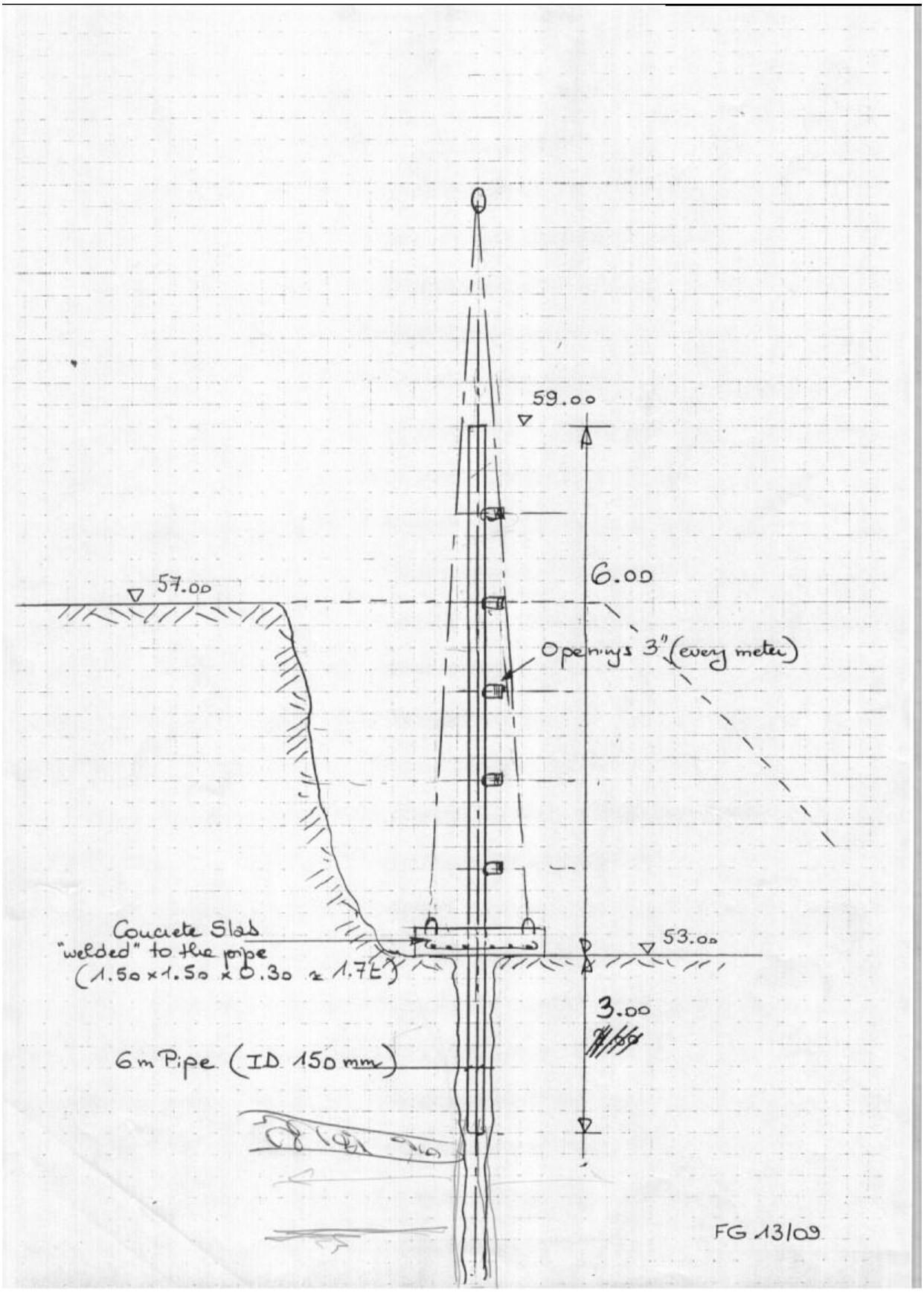
2500 كجم اسمنت و750 كجم بنتونيت

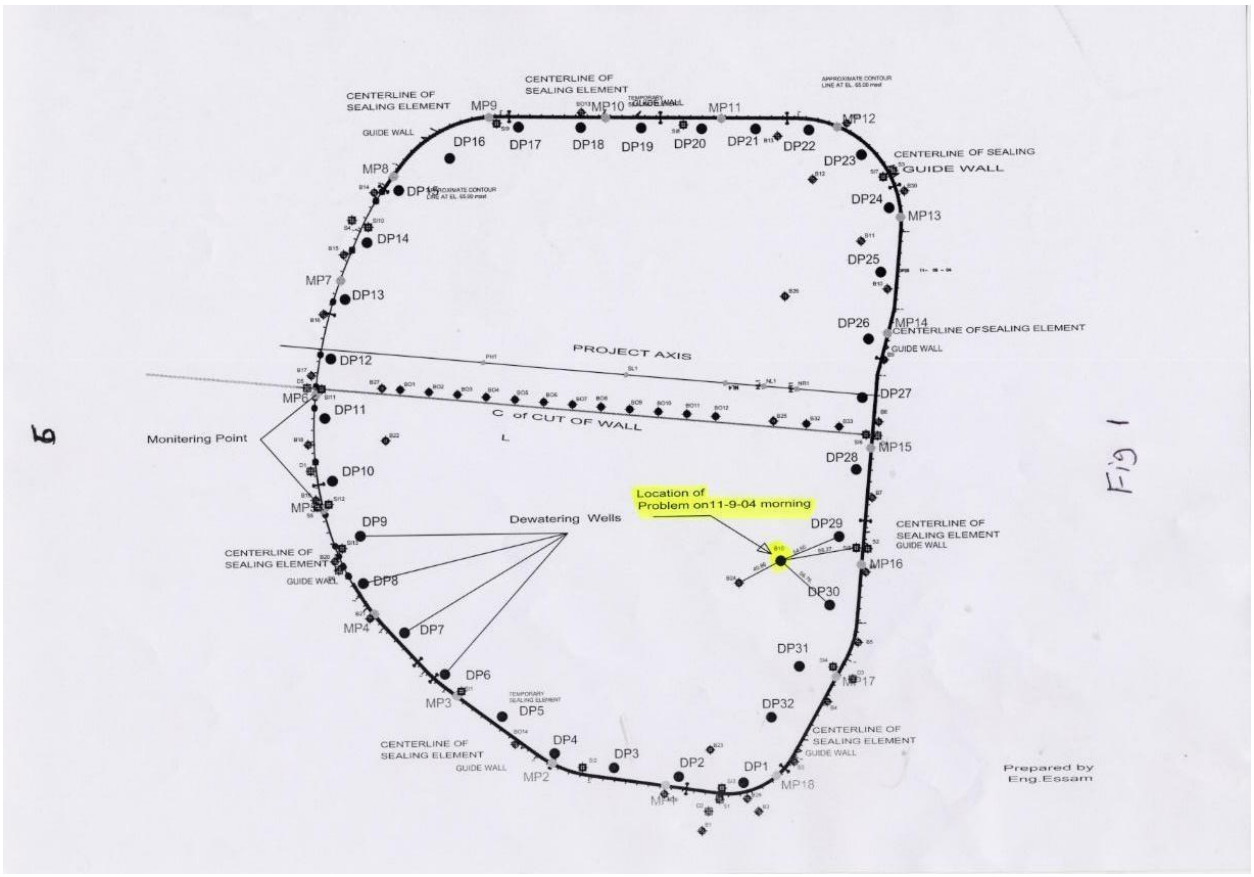
الدروس المستفادة

المشكلة ناتجة عن عدم ردم البئر القديمة B10 بشكل كامل، مما أدى إلى تسرب المياه تحت الضغط الارتوازي.

لابد من الاهتمام التأكد من قفل آبار البيزوميترات بطريقة سليمة ومطابقة للمواصفات لأنها للأسف تترك في نهاية الاعمال لمن هم لا يقدرون أهمية هذا الموضوع ومن الممكن ان تكون النتائج كارثيه.

مرفق ملف ببعض الصور والرسومات


59.00
6.00
57.00
Openings 3" (every meter)
Concrete Slab
"welded" to the pipe
(1.50 x 1.50 x 0.30 x 1.7t)
53.00
3.00
6m Pipe (ID 150 mm)
FG 13/09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MP18
Prepared by
Eng.Essam

Fig 1


2004 9 20


2004 9 20


2004 9 20


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2004 9 20


2004 9 21


2004 9 21


2004 9 23


2004 9 24

GROUTING OF OPEN BOREHOLE IN THE CONSTRUCTION PIT AREA

Prepared by :Eng .Salah awad
3 November 2004

Table of contents page

Background

During excavation inside construction pit at 11-9-2004 level (53.00) spring in the location of Navigation lock area up stream was gusted .It was raised above the excavation level . The sandy gravel soil was used to fill the spring and the excavation was stopped .The survey team took the location of this spring and it was :

x=29823.23

Y=84067.15

Z=53.20

The spring had a diameter of about 10-15 cm. The water outflow was ongoing for about 10 minutes before stopped with putting sand and gravel material.

The location of this spring was identical with the borehole BI0 location from the investigation campaign on right bank in year 2000

References

1-Volume 4 (Information for tenders) clause 8 Geology and Geotecnics sub-clause 8.5:Supplementary borehole investigations .

2-Letter NHBDC/NHBJV/01487 Dated 13 September 2004

3- Letter NHBDC/RGBS/0394 Dated 13 September 2004

4- Letter NHBDC/NHBJV/01490 Dated 13 September 2004

5- Letter NHBDC/RGBS/0393 Dated 15 September 2004

6- Letter NHBDC/RGBS/0396 Dated 19 September 2004

7-The meeting held at 19 september 2004 include(RGBS,NHBDC,NHBJV)

8- Letter NHBDC/NHBJV/L1/01495 Dated 20 September 2004

9-Letter NHO1/NHBDC/ C/02076 Dated 25 September 2004

10-Annex B Revised schedule of quantities ,rates and prices

The old borehole (B10)

The old borehole no B10 is one of a total 23 supplementary boreholes which drilled in April and may 2000 at the construction pit location on request of the panel of experts (POE) . The purpose of the investigations was to condense the grid of boundary information about the Pleistocene silt and clay layer at depth.

Those boreholes are divided in two types :

1- 11Boreholes on shore (NO.B1,B2,B3,B4,B5,B6,B7,B8,B9,B10,B11)

2-12 Boreholes off shore (NO. R1,R2,R3,R4,R5,R6,R7,R8,R9,R10,R11,R12)

These investigations were performed by Miser Raymond Foundation with Aclcer Mark 11 rigs under the cover of HW casing to depths between 6 and 20m and then with support of bentonite .

In all boreholes SPT according to ASTM D 1586 were performed at intervals of 1.5 to 3.0 m immediately after a change of strata as indicated by the soil transported with the drilling mud .Disturbed samples from all SPTS were collected in the split –barrel.

The strata encountered are shown in the following table:

Strata encountered at construction pit site (Bore hole B10)

Holocene			Sand and gravel (Pleistocene) interspersed by:							
Borehole No	Ground surface	Silt	Broken stone Fragments (0)		Broken stone Fragments (1)		Broken stone Fragments (2)		Silt and clay	
		base	base	top	top	base	top	base	top	base
B10	67.10	59.30	-	-	42.7 41.00	41.5 40.10	25.00	24.1	21.50	12.10

The following table shows the laboratory test results of silt and clay:

BH	Depth masl	Water Content %	Liquid Limit %	Plastic Limit %	Plasticity Index %	Consist. Index %	Fines Content (-)	classification
B10	44.40		46.1	23.9	22.2		65.8	Cl
	45.95	23.3	64.0	26.2	37.8	1.08	91.0	CH
	49.95		64.5	26.4	38.2		96.4	CH
	53.95		61.9	26.1	35.8		93.8	CH

The Bore log for this borehole are shown in the following pages no. 7, 8

The probable reason

After study the problem which happened in the construction pit area at Navigation locks area .It the most probably that the main reason of the leakage that this boreholes (B10) was not grouted along it's entire length .

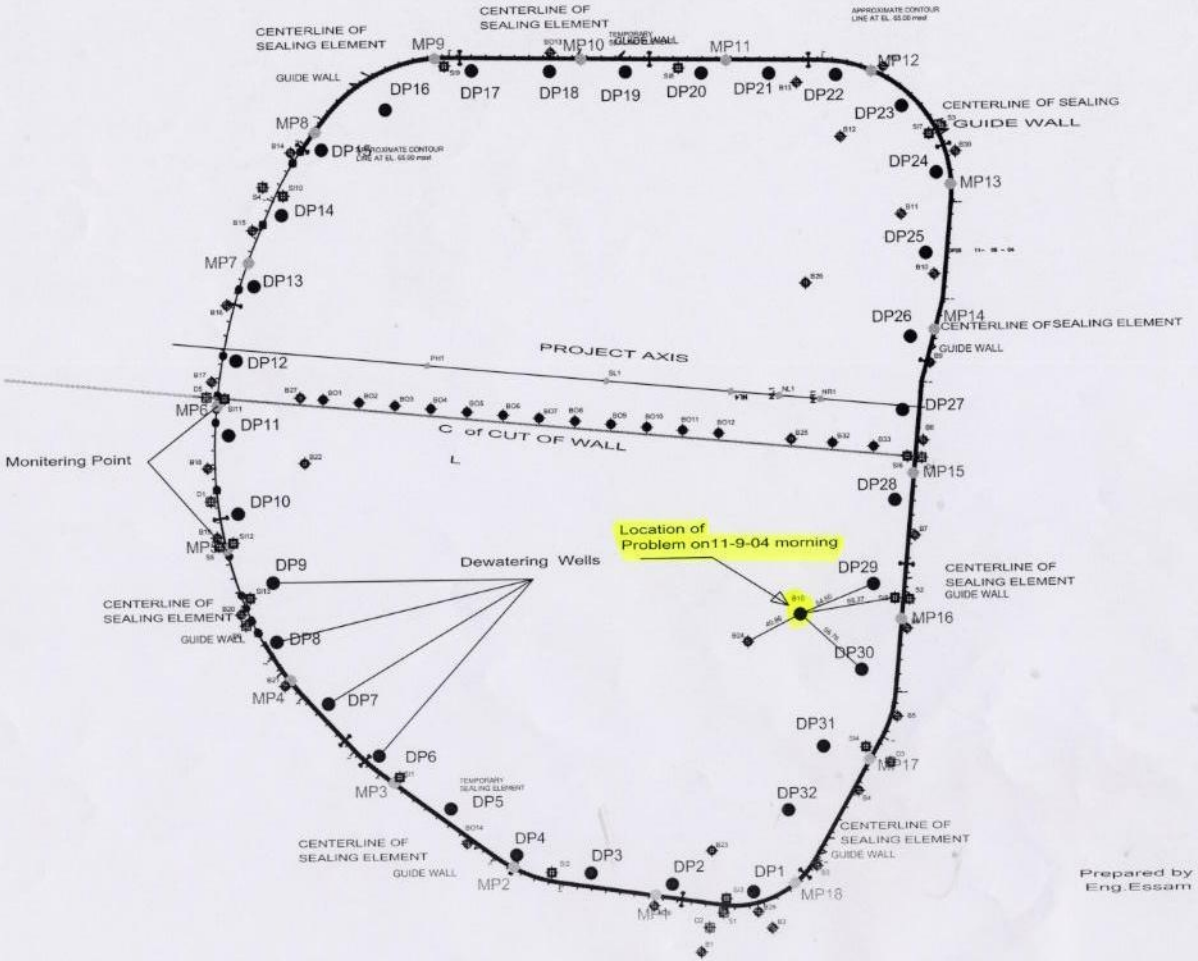
To be sure no way to know that except for re-drilling the borehole and see the quantity of the grouting .

The proposed solutions for plugging the spring

In order to overcome the leakage which spring at location of the old borehole no B10 and to safe the excavation process at the Navigation lock area three solutions are introduced by NHBDC :

1-Re-drilling and grouting (B10)

The first step is to find the old borehole from an upper level and hit it by drilling where it was observed at about (53.00)m asl .Therefore the hole must be opened again and a pipe with a diameter of 150 mm and a length of 9.00m high will be installed and raised to the drilling /grouting platform at(63.00)m asl .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Prepared by Eng.Essam

Fig 1

Project	: NAGA HAMADI BARRAGE	**location**	: New Barrage Area Naga Hamadi	**BOREHOLE NO.**	: **B-10**
Job No.	: MY-671	**Ground Elevation**	: 67.11m	**Coordinates**	: E. 29823.178 N. 84067.097
Date	: April 16-18, 2000	**Casing Size**	: 101.6mm	**Depth Cased**	: 6.00m
Foreman	: Sayed Khalil			**Sheet**	: 1 of 2

Depth m.	ft.	Samples No.	Type	S.P.T. or % Recy	Strata Log	Elev. 67.11m	Description	Water Table	Remarks
		D - 1		2			Soft to medium stiff, dark brown, clayey **SILT**, trace fine sand.		
1	5								
2		D - 2		7					
3	10								
4		D - 3		12		63.11m			
	15						Medium dense, dark brown, fine sandy **SILT**, some clay.		
5								5.40m	
6	20	D - 4		14					
7									
	25								
8		D - 5		14		59.31m	Medium dense, greyish brown, fine **SAND**, some silt, trace clay.		
9	30								
10		D - 6		15					
11	35								
12	40	D - 7		12			greyish brown to brownish grey, trace silt, below Elev. 55.11m		
13									
	45								
14		D - 8		16					
15	50								
16		D - 9		27					
17	55								
18	60	D -10		28			medium to fine **SAND**, trace silt, below Elev. 49.11m		
19									
	65								
20		D -11		30					
21	70								
22		D -12		35			dense, greyish brown, trace silt and fine gravel, below Elev. 45.36m		
23	75								
24	80	D -13		50/13cm		42.71m	very dense, below Elev. 43.11m		(31/15 & 50/13cm)
25			W.S -1				Mottled brown and grey, coarse to fine **GRAVEL** and **BROKEN STONE** fragments.		
	85	D -14		50/12cm		41.51m			(29/15 & 50/12cm)
26			W.S -2			41.01m	Very dense, greyish brown, medium to fine **SAND**, trace silt and fine gravel.		
27	90	D -15		35		40.11m	Mottled brown and grey, fine **GRAVEL** and **BROKEN STONE** fragments.		
28									
29	95	D -16		36			Dense, greyish brown, medium to fine **SAND**, trace silt.		
30	100								

Abd El Khalek Gamal Madkour

Fig. 2-A

BOREHOLE NO. B-10 Sheet : 2 of 2

Depth m.	ft.	Samples No.	Type	S.P.T. or % Recy	Strata Log	Elev.	Description	Water Table	Remarks
31		D -17		37			Dense, greyish brown, medium to fine **SAND**, trace silt.		
32	105						dense to very dense, greyish brown, medium **SAND**, some coarse to fine sand, trace coarse to fine gravel, below Elev. 36.11m		
33	110	D -18		48					
34									
35	115	D -19		50/13cm					(37/15 & 50/13cm)
36	120								
37		D -20		50/14cm					(30/15 & 50/14cm)
38	125								
39		D -21		79					
40	130								
41	135	D -22		98/25cm					(27/15, 48/15 & 50/10cm)
42						25.01m	Mottled brown and grey, coarse to fine **GRAVEL** and **BROKEN STONE** fragments.		
43	140	W.S -3				24.11m			
		D -23		52			Very dense, greyish brown, medium **SAND**, some coarse and fine sand, trace coarse to fine gravel.		
44	145	D -24		68		23.01m			
45						22.71m	Hard, dark grey, clayey **SILT**, some fine sand.		
46	150	D -25		75		21.51m	Very dense, grey, fine **SAND**, some silt, trace clay.		
47	155						Hard, dark grey to grey, silty **CLAY**.		
48		D -26		62					
49	160								
50		D -27		44					
51	165								
52	170	D -28		46					
53	175								
54		D -29		52					
55	180					12.11m			
56		D -30		50/14cm			Very dense, grey, fine **SAND**, some silt.		(20/15 & 50/14cm)
57	185								
58		D -31		71					
59	190								
60	195	D -32		90		7.66m			
61	200								
62	205								

Abd El Khalek Gamal Madkour

Fig. 2-B

Normal drilling equipment must be able to guided through this pipe to find the old open borehole (minimum inner diameter of the pipe 110 mm) .

The first step is to insert a grouting pipe through this auxiliary pipe down to the bottom of the clay layer and grout from there upwards lifting the grout pipe in steps. If it is not possible to bring down the pipe , the borehole must be re-drilled again through the auxiliary pipe followed by grouting .

It may be noted that the drilling method has also some risks. The drilling rig may not follow the hole over the full length . because obstacles in the spring channel cannot be excluded .If the drilling rod does not find the obstacles it may reach the bottom of the borehole and a grouting pipe can be installed .Cement mortar could be pumped into the hole beginning at the bottom to finally seal it. If the sealing is not effective, additional grout holes must be drilled around the hole in a grid of about 1.2m which must be from below the silt and clay layer .

NHBDC thought that the grouting method is not fully predictable, and in the worst case additional punching of the clay layer may be caused . Grouting of cement/ sand must be used preferably.

2-Installation of a well

one possibility is to create a filtered well above the spring to get the water under control, which means that no fines shall be washed out and the water shall be conveyed outside of the foundation area into a sump .

later on after establishing the foundation of the navigation lock, the well may be grouted with cement grout . For this reason grouting pipes shall be installed in the well during its construction.

The execution of the well above the spring can be done from a level depending on the available casing and specific dimensions of a drilling rig . Considering the available equipment at site (Baure BG 15) which was used for drilling deep wells .the drilling could be started from a plat form at level of about 61.00m asl using the casing of appr. 6.00and 11.00m . the 11.00 m casing could be installed from (65.00) to(54.00)m asl and the drilling could be done inside down to appr.44.00m asl under a constant head of water to the rim of the casing . A slotted filter pipe with a pump sump at the bottom could be installed for controlled pumping in order to facilitate foundation works.

With this method the water flow has to be pumped out of the construction pit or could be used as water supply in the construction for all works. A period of about 6-8 months after completion of the above foundation is foreseen until the well can be abandoned and finally grouted .

A proper filter must be placed in order to retain the fines . Some risk cannot be totally excluded concerning the effectiveness.

3- Installation of a concrete plug

By using the Bauer BG15 which already exist in site to drill a 80 cm hole till 40.00m depth from the platform (64.00) m asl and then the hole filled with the plain concrete in order to plug the location of the BH10 and the area surrounding it .

The Employer , Consultant and J.V chose the grouting solution for both technical and contractual reasons .The reasons were .

- Enormous earthworks to establish a working platform at about (64.00)msl for the heavy well drilling rig including the ramps in case of

using installation a well where the small drilling rig for the drilling and grouting can be lifted by a crane to a smaller platform.

- The plug solution is restricted to the equipment at site which is able to drill only to a maximum depth of 41.00 m. which would mean, with this solution the bottom silt/ clay layer cannot be reached
- The drilling and grouting method will most probably follow the old borehole and can be extended into the top of the silt and clay layer. In this case ,after successful grouting ,no water will feed the dewatering system inside the construction pit. If the drilling rig should not follow the old borehole on the full depth, at last a plug will be established by grouting, whish considered to be safe against uplift forces.
- To install a well remains the last solution if the installation of a plug in the borehole by grouting means should fail. It has the disadvantage that the well will feed the dewatering system and it must be controlled in a continuous manner that no fines will be washed out.

The three solutions are shown in the following pages no. (12-15)

Remedial sequences

The purpose of this drilling is to plug the spring water at B10 location to stop the water spring and to safe the excavation process in the Navigation locks area, and to prevent any leakage during the construction phase . To do that many steps were performed as following:

A-On 11-9-2004 survey works to compute the location of the spring and it was found that x=29823.23 y=84067.15 z=53.20 m asl

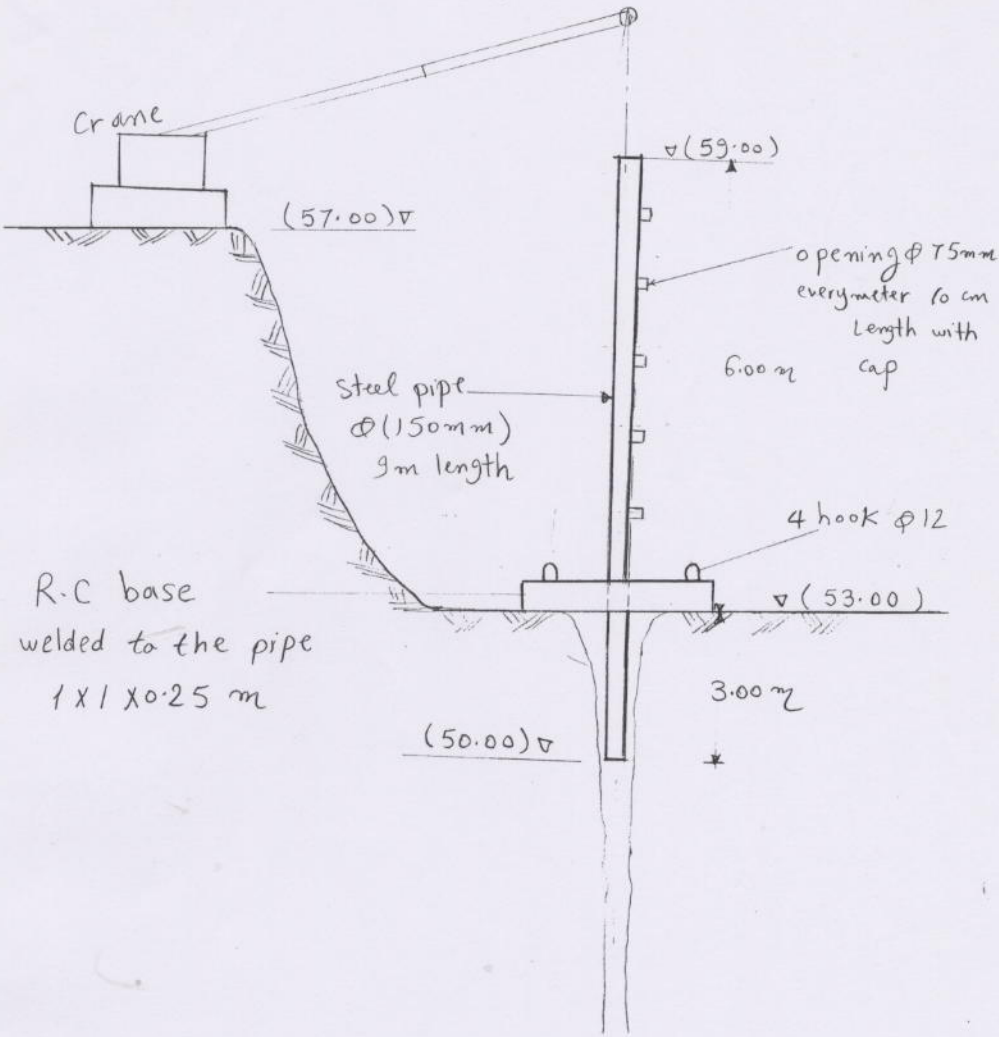

Fig. No. 3-1-A

Grouting Solution first stage.

(installation of base Concerete with the steel pipe)

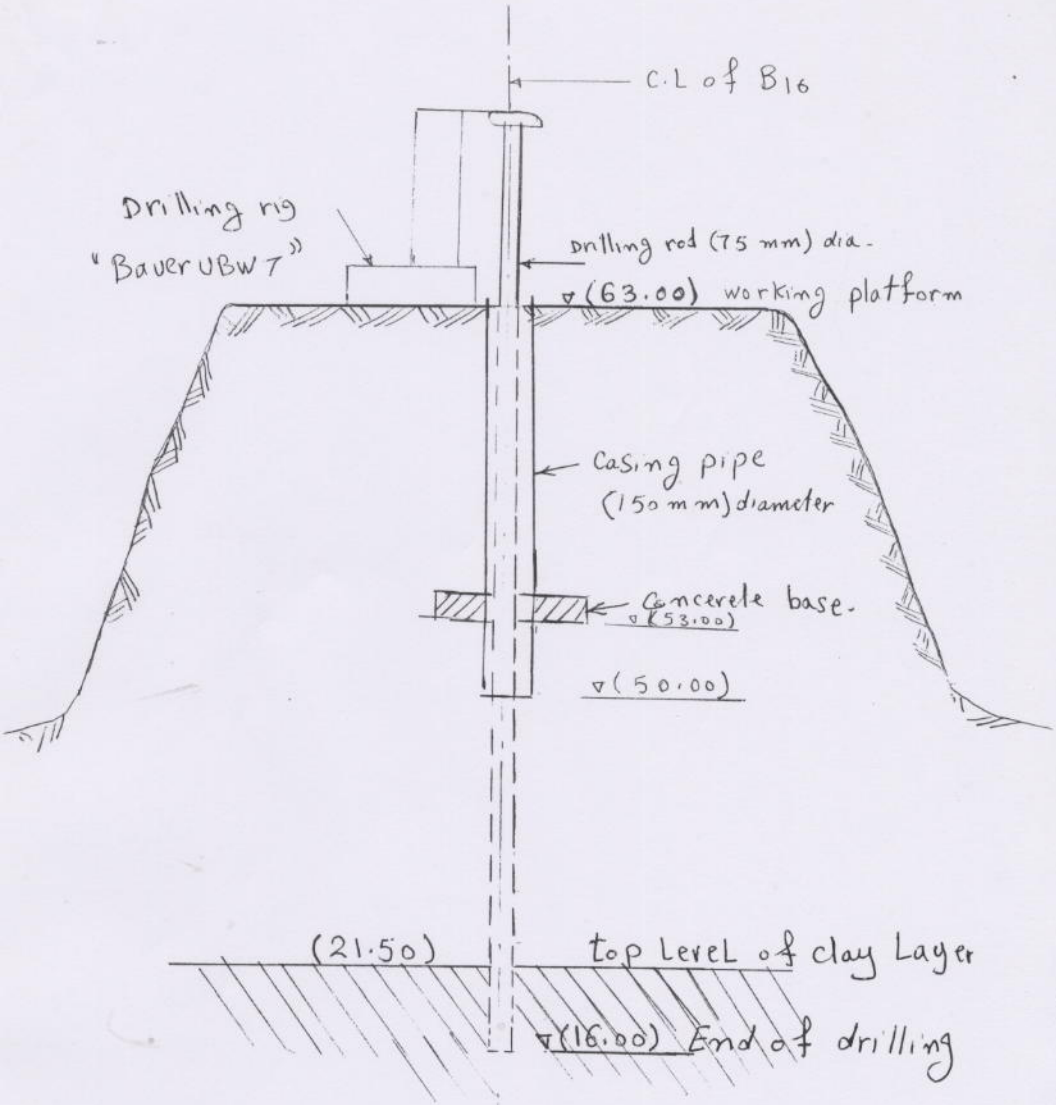

Fig. 3-1-B Grouting Solution Second Stage.
Re-drilling and Grouting of the old bore hole B_{10}

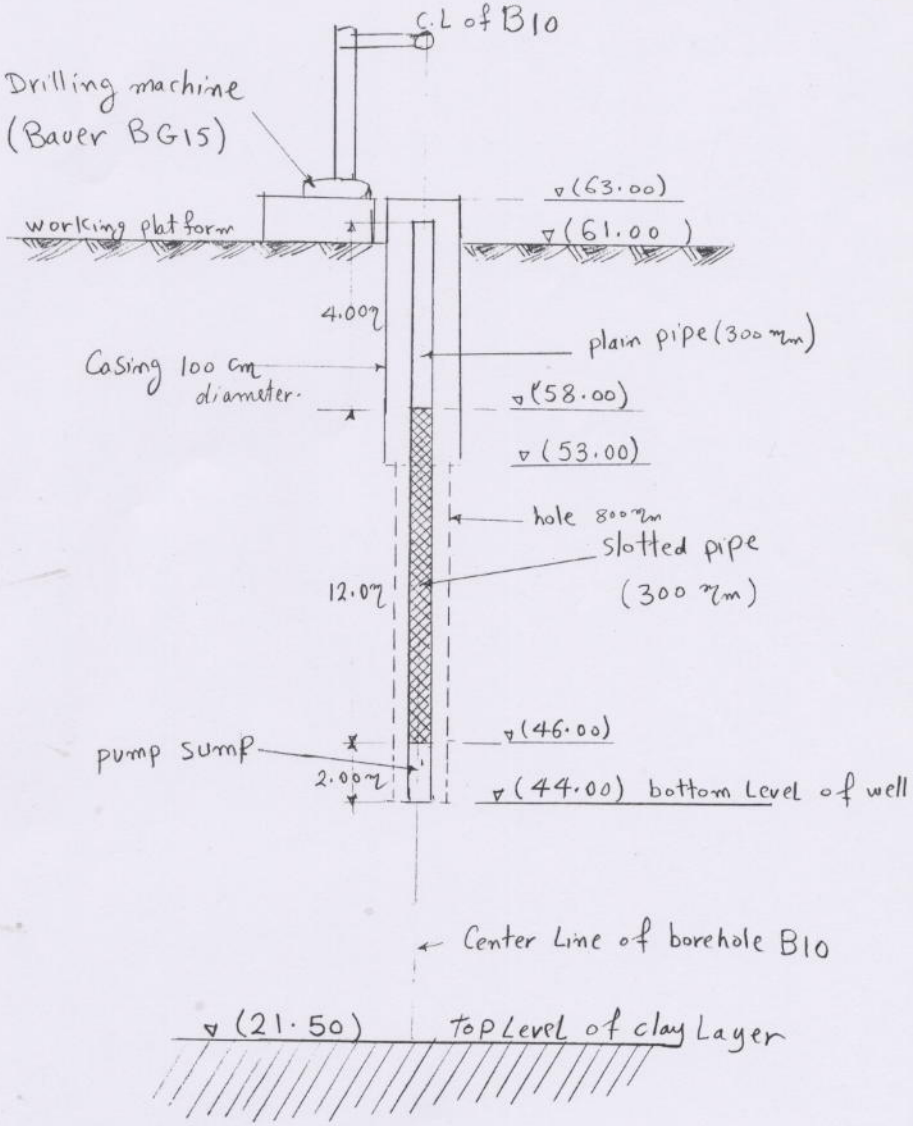

Fig. 3-2 Solution No 2

Installation of a well.

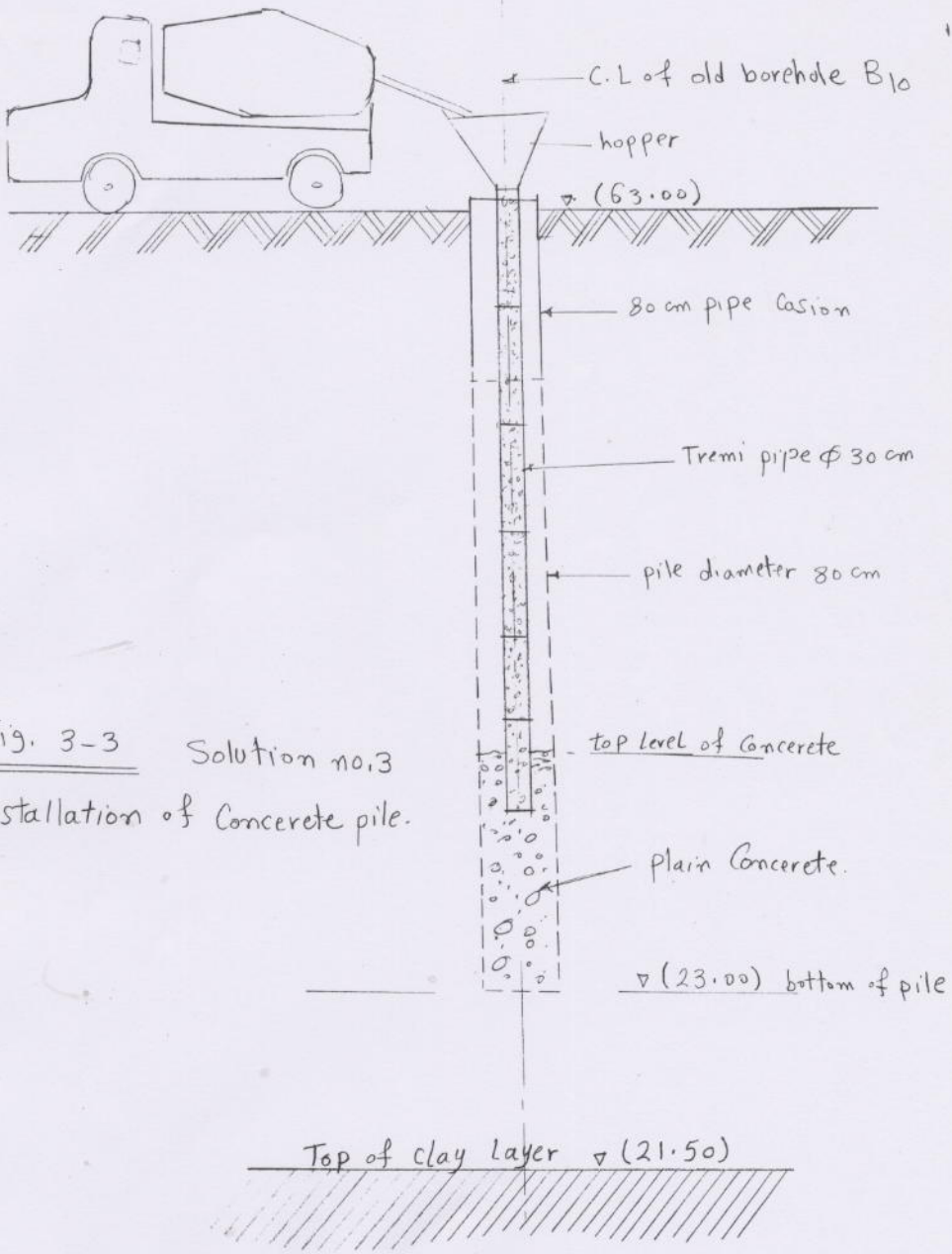

Fig. 3-3 Solution no.3
Installation of Concerete pile.

And then backfilling with sandy gravel soil to stop water leakage immediately after the spring occurred . After that access road was performed and platform was executed to place steel pipe 6 inch diameter at level (53.00)

B- on 14-9-2004 Installation of base concrete 1.00*1.00*0.25 m with reinforcement 6Φ16/m occupied with 4 hook Φ12 mild steel 4*1m at precast yard

C- On 15-9-2004 A steel pipe 9.00m long Φ(150mm)was prepared at the precast yard with six vents Φ(75mm) steel pipe 10 cm long each at precast yard

D- on 16-9-2004 Making access road for crane at level (57.00) and backfilling with sand and gravel , making access for trucks at level(50.90)

E- On 21-9-2004 excavation from level 57.00 to level 53.00 to put pipe in place and backfill around the pipe with sand and gravel .

F-On 23-9-2004 complete backfilling around leakage area till level(63.00)

G-On 25-9-2004 mobilization for drilling equipment (Bauer UBW7)

H-On 26-9-2004 Drilling of the old borehole no B10 by using 3 inch diam. Pipe with rotary drilling method which done by geotechnical Egypt. during drilling process, it was observed losses of bentonite from level(63.00)till level (26.00) after bentonite losses stoped,The drill operator felt nature soil and gravel layers. The drilling continued till top of clay layer at level (21.50),bentonite slurry for excavation was coming up with traces of old grout (cement).The drilling reached at level (16.00)

I-After reaching at level (16.00) with penetration 5.5m inside the silt and clay layer the grouting was started with cement and water ratio 1.5:1 and continued till the top of platform.

J-On 30/9/2004 removal of the earth around the steel pip and cut the pipe with care that no additional forces will effect to the pipe .the excavation continued till the foundation level of this part and the pipe was cut till 0.30m blew this level .

The sequences are shown in pages (18 –21)

Measurement and payment

A lot of discussion was held between J.V and the employer for estimation the cost of such work which was not for seen for the contractor . ON the other hand the contractor is not responsible for this leakage , for this reason the consultant with the employer instruct the contractor to make records for all the work (labors ,equipment, materials) each day and signed by the employer/consultant the latest by the next day noon . The contractor recorded the day work sheets and reviewed by the consultant up to 23-9-2004 the summary of this review are:

- Equipment

equipment	No.0f hours	Unit price		Total price		notes
		l.c	f.c	l.c	f.c	
Excavator	17					
Loader	91.5					
Mobil crane 60 t	3	98.3	1.01			25t
Trucks	240	53.65	0.55			15tcapacity
Traylor	1	35.77	2.50			20t capacity
Water tank truck	7	21.45	0.40			Rear dump truck $4m^3$
Compactor	10	12.53	0.63			B-2(Add.5)
Grader	1					
Welding machine	4.5	17.88	0.51			B-29(Add.5)
Hiab	0.5					

Sequences of Grouting B_{10}

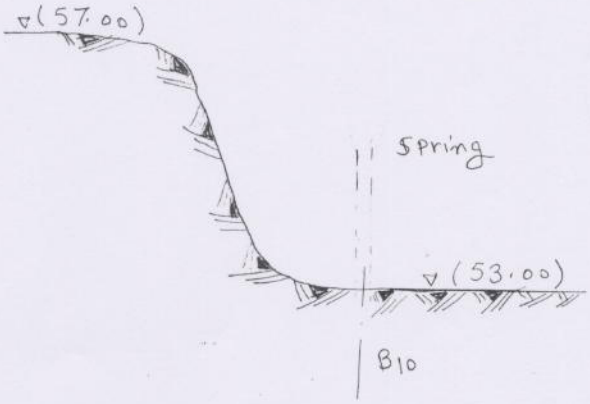

Fig. 4-A

Spring in Navagation Lock area up streem at Level (53.00)

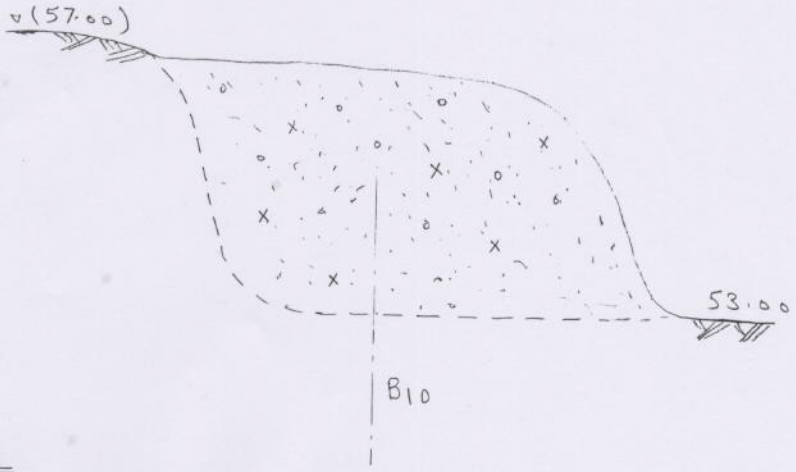

Fig 4-B

Back filling with Sandy Gravel Soil to stop water Leakage.

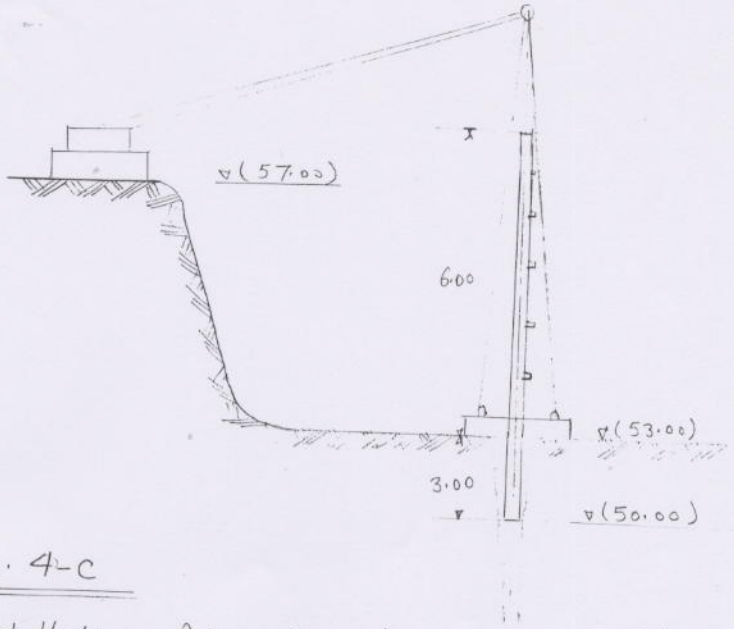

Fig. 4-C

installation of base Concerete with the stee pipe

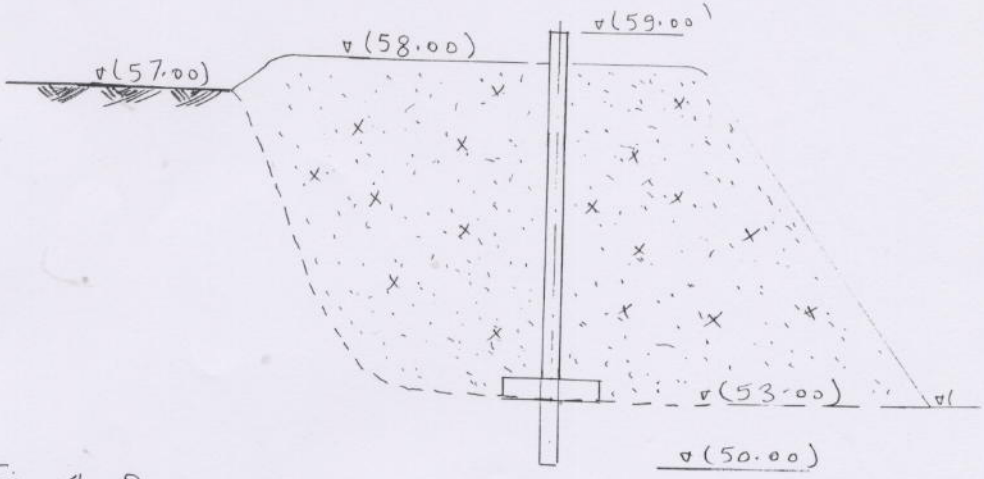

Fig. 4-D

Backfilling around the Leakage area and steel pipe

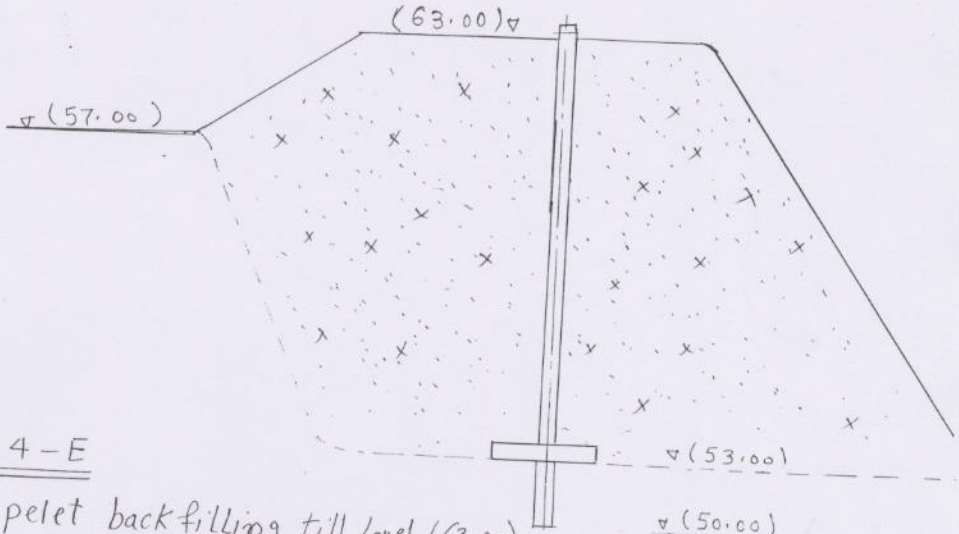

Fig. 4-E

Compelet backfilling till level (63.00) and increase the Length of the pipe.

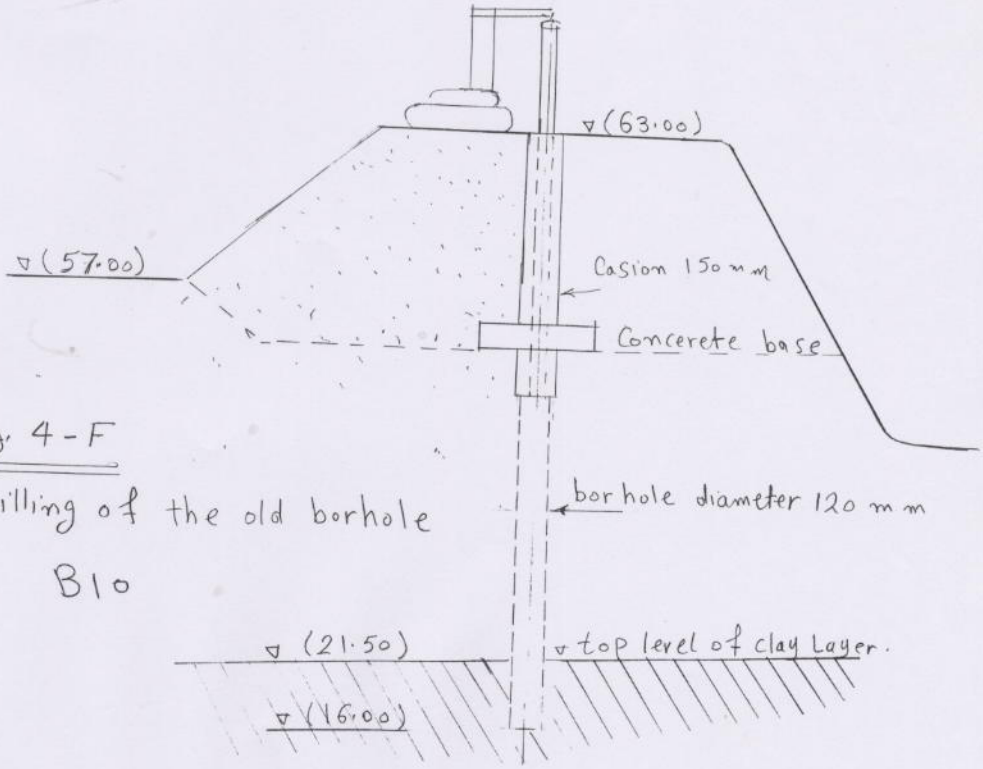

Fig. 4-F

Drilling of the old borhole B10

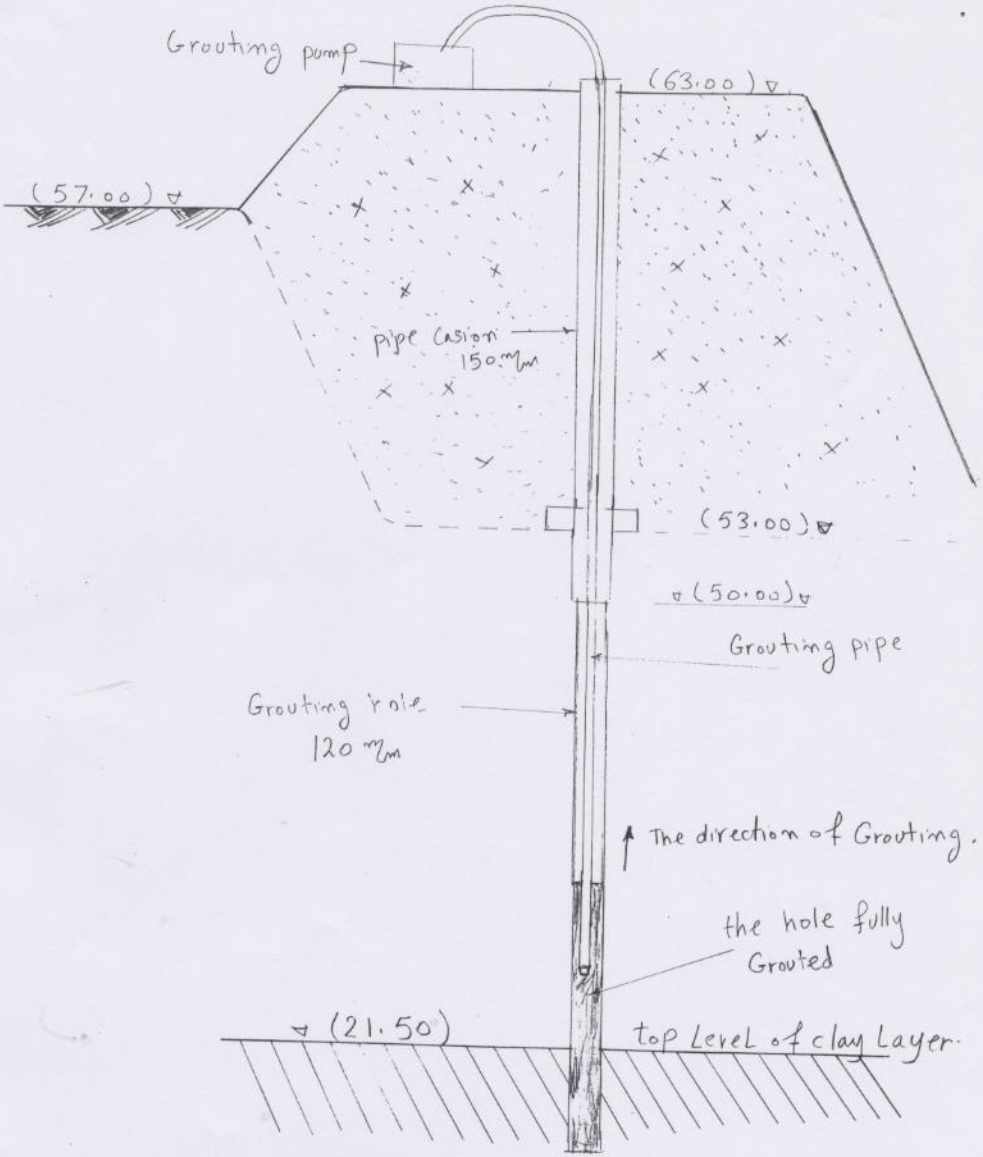

Fig. 4 - G

Grouting of the old Bore hole B_{10}

- Categories

discription	No.0f hours	Unit price		total price		notes
		l.c	f.c	l.c	f.c	
Engineer	27					
Supervisor	50.5					
Forman(ganger)	27	8.86	-			
Labor	128	2.77	-			A1-4(Add. 5)
surveyor	4					
Helper	6					
Time keeper	11					
Safety	3					
Plumper	6	7.13	-			
Driver, operator	365.5	5.35	-			A4-1(Add-5)
Carpenter	3					
Helper for carpenter	3					
Steel fixer	2					
Helper for steel fixer	2					
concreter	1					

- Materials
  - Electrodes for welding = 3.50 kg
  - C channel =2m

- Steel pipe Φ6 inch =9.0m

- Steel pipe Φ3 inch =0.3m

-Steel cap 6*3 inch = 6 ps

- Base concrete 1.0*1.0*0.25=0.25 m^3

-12 steel bars Φ16 mm 0.90m length =10.80m

-4 hook Φ12 mm mild steel 1.00m length =4.0m

-Total quantity of bentonite = 30 bags*25 kg=750 kg

-Total quantity of cement =26 bags*50 kg= 1300 kg

- B.O.Q items

For drilling of boreholes onshore or offshore B.O.Q 2.111 and 2.112 items should be applied but in this case the contractor did not take samples from the soil by single or double core , moreover the contractor did not perform standard penetration test for the soil . Only item 2.112 may be applied in this case .

No.	Item description	quantity	unit	Unit price		Total price	
				l.c	f.c	L.c	f.c
2.111	Hole drilled onshore or offshore	47.00	M	126.8	25.5		
2.112	Set up of borehole onshore	1.0	No.	608.7	122.4		

List of attachments

1-Letter NHBDC/NHBJV/01487 Dated 13 September 2004

2- Letter NHBDC/RGBS/0394 Dated 13 September 2004

3- Letter NHBDC/NHBJV/01490 Dated 13 September 2004

4- Letter NHBDC/RGBS/0393 Dated 15 September 2004

5- Letter NHBDC/RGBS/0396 Dated 19 September 200

6- Letter NHBDC/NHBJV/L1/01495 Dated 20 September 2004

7-Letter NHO1/NHBDC/ C/02076 Dated 25 September 2004

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NHBDC/NHBJV/L1/01487

13 September 2004

Mr. Sylvestre Guillien
Project Manager - NHBJV,
Nile Hilton – Commercial Center
2nd Floor, Office 36, Tahrir Square

New Naga Hammadi Barrage and Hydropower Plant
Lot 1 – Civil Work

Subject: **Spring in the Navigation Lock area**

Reference:

Dear Mr. Guillien,

The Employer/Consultant appreciate the prompt action, on 11 September 2004, taken by the Lot 1 Contractor upon verbal instruction of the Consultant when a strong spring appeared on level 52m excavations in the navigation lock area.

Since Lot 1 Contractor is not responsible for the cause of the matter, Lot 1 is hereby instructed to keep a detailed record for all works done directly related to this issue for payment purposes. Please ensure that the daily records are signed by the Employer/Consultant, the latest by next day noon.

Further works to solve the problem after covering the spring by gravel on 11 September 2004 are under discussion.

Yours Sincerely,

B. R. Hein
Chief Resident Engineer NHBDC

cc: RGBS-Site: Eng. Mohammed Abd El Aal, RE
NHBDC-Cairo: Dr. J. Kohli, PM

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NHBDC/RGBS/L1/00394 13 September 2003

Eng. Mohammed Abd El Aal
Resident Engineer
RGBS – Site
Naga Hammadi Barrage

New Naga Hammadi Barrage and Hydropower Plant

LOT 1 – Civil Works

Subject: Spring in the Future Navigation Lock area

Dear Eng Mohammed Abd El Aal,

On 11 September 2004, a strong spring developed in the future navigation lock area when excavation reached level 52m. The position of this spring is about identical with the old borehole No. 10 of the year 2000 drilling campaign. This prompted the Consultant to instruct Lot 1 Contractor to start the repair work to stop the water flow into the Construction Pit.
Since Lot 1 Contractor is not responsible for the cause of the matter, Lot 1 was instructed to keep a detailed record, to be signed by the Employer/Consultant the latest by next day noon, for all works done directly related to this issue for payment purposes.

However, the Consultant would like to emphasize that according to our present status of information everything was done in a proper and professional manner when the boreholes were grouted. Consequently, it is practically impossible to determine the real cause of the spring where many factors could be considered. Nevertheless, the Employer/Consultant jointly with the Lot 1 Contractor are actively looking at implementing the best chosen solution so that the problem is solved without any consequential delay to the progress of works.

We trust the Employer concurs with the above facts relating to the above subject.

Yours Sincerely,

B. R. Hein
Chief Resident Engineer NHBDC

-BT

cc: NHBDC-Cairo: Dr. J. Kohli, PM

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NHBDC/NHBJV/L1/01490

13 September 2004

Mr. Sylvestre Guillien
Project Manager
Naga Hammadi Barrage JV
Nile Hilton, Commercial Center
2nd Floor Office # 36
Al Tahrir Square, Cairo, Egypt

New Naga Hammadi Barrage and Hydropower Plant
Lot 1 – Civil Work

Subject: **Construction Pit - Break through of the Artesian Water at Borehole B10**

References: Discussion between the parties on 12/13 September 2004

Dear Mr. Guillien,

We refer to joint discussion how to solve the matter of an open borehole. According to Employer, the grouting solution is preferred. In order to find and fix the borehole, a steel pipe shall be inserted in the hole by 3 m which is extended by another 6 m above as per jointly agreed attached sketch by the Lot 1 Contractor.

The steel pipe with lockable openings and a concrete plate shall be prefabricated and installed with a crane under the supervision of the Employer/Consultant and backfilled to the necessary working platform level for possible drilling and grouting activities to follow.

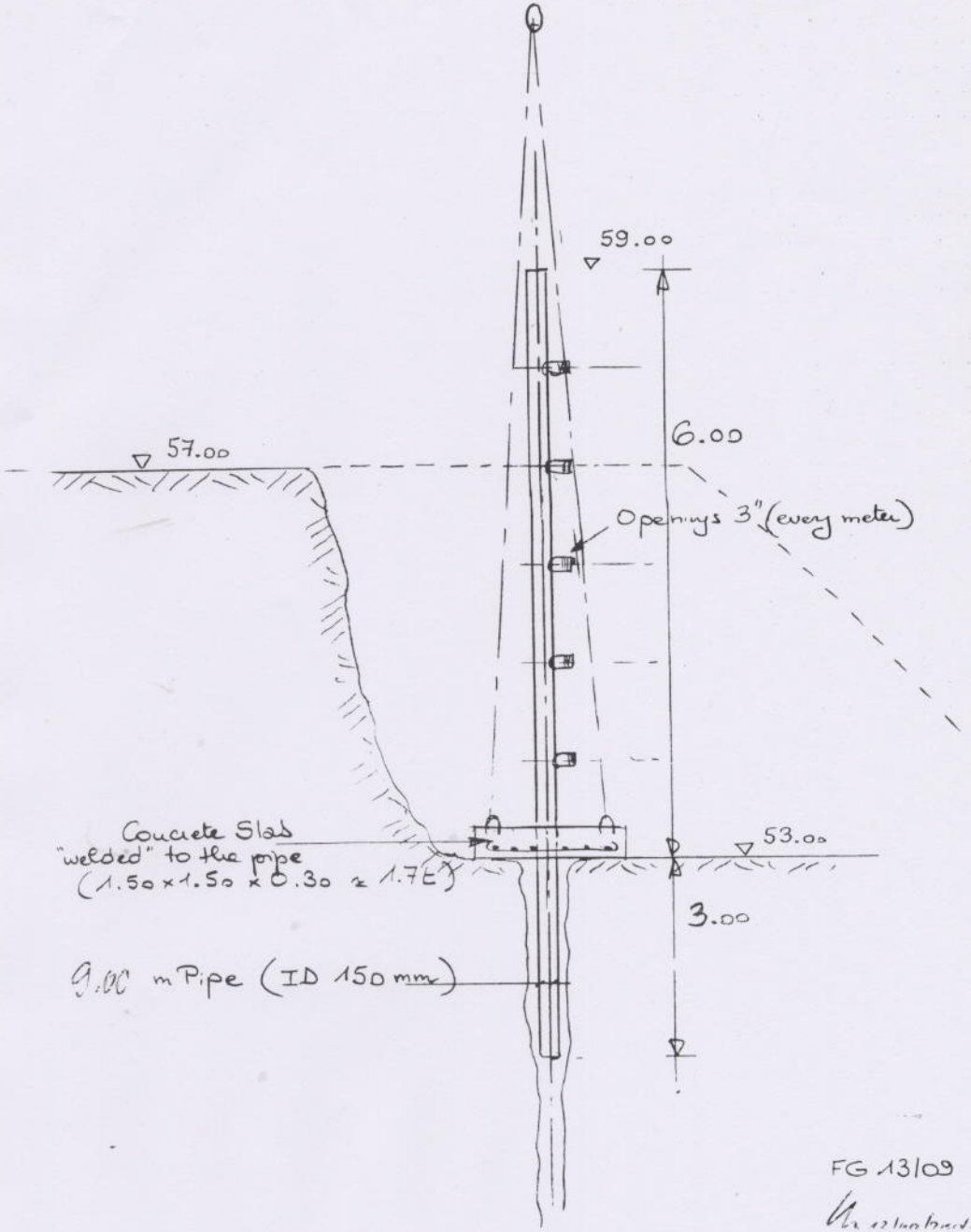
Yours Sincerely,

B. R. Hein
Chief Resident Engineer

TE

cc: RGBS Site: Eng. Mohammed Abd El Aal, RE
NHBDC Cairo: Dr. J. Kohli, PM

Attachment: Sketch as mentioned above


59.00
6.00
57.00
Openings 3" (every meter)
Concrete Slab
"welded" to the pipe
(1.50 x 1.50 x 0.30 x 1.7E)
53.00
3.00
9.00 m Pipe (ID 150 mm)

FG 13/09

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NHBDC/RGBS/L1/00393 15 September 2004

Eng. Mohammed Abd El Aal
Resident Engineer
RGBS – Site
Naga Hammadi Barrage

New Naga Hammadi Barrage and Hydropower Plant
Lot 1 – Civil Works

Subject: Construction Pit – Spring on Level 53 m

Reference: Site Visit, 11 September 2004

Dear Eng Mohammed Abd El Aal,

We refer to the incident on 11 September 2004 when during excavation works from level 57 to level 52 a spring was encountered which was most probably at the Borehole B10 location from the investigation campaign on right bank in year 2000, located in the upstream part of the Navigation Lock.

Hereby, we inform you about our latest observations and considerations for possible solutions:

Observation:

The spring had a diameter of about 10-15 cm. The water flow was considerable. When the Consultant arrived at the Site, the water outflow was ongoing for about 10 minutes. In order not to risk material transport and erosion through the flowing water, the Consultant together with the Site Manager of the JV decided to stop the flow by putting Sand & Gravel material on top of the point as an emergency measure. The material came from excavation inside the upstream cofferdam. The water was always breaking through the fill until it was covered by Sand & Gravel up to about 56 m asl. For safety reasons, the fill was extended at the slopes and on top to about level 57.00. Since then, no open water flow was observed anymore.

Before filling Sand & Gravel material a survey was carried out by the Contractor for the spring center with the following values:

X= 29823.23
Y= 84067.15
Z= 53.20 m asl

In the meantime discussions between the parties were held which can be summarized as follows:

There are 2 principle solutions with different aspects.

Solution A: Installation of a Well

One possibility is to create a filtered well above the spring to get the water under control, which means that no fines shall be washed out and the water shall be conveyed outside of the foundation area into a sump. Later on, after establishing the slab foundation of the Navigation Lock, the well may be grouted with cement grout. For this reason grouting pipes shall be installed in the well during its construction.

The execution of the well above the spring can be done from a level depending on the available casing and specific dimensions of a drilling rig. Considering the available equipment at Site (Bauer BG15) which was used for drilling deep wells, the drilling could be started from a platform at level of about 61 m asl using the casing of appr. 6 and 11 m. The 11 m-casing could be installed from 65 to 54 m asl and the drilling could be done inside down to appr. 44 m asl under a constant head of water to the rim of the casing. A slotted filter pipe with a pump sump at the bottom could be installed for controlled pumping in order to facilitate foundation works. With this method the water flow has to be pumped out of the Construction Pit or could be used as water supply in the Construction Pit for all works. A period of about 6-8 months after completion of the above foundation is foreseen until the well can be abandoned and finally grouted.

A proper filter must be placed in order to retain the fines. Some risk cannot be totally excluded concerning the effectiveness of the filter.

Solution B: Grouting

In principle, grouting against water flow with cement grout is not possible. That means, the grouting should be done from a level which is above the artesian water head. This would require a platform in the range of 64 to 65 m asl, which includes quite some earthworks.

To find the old borehole from an upper level and to hit it by drilling where it was observed at about 53 m asl is a doubtful operation. However, it is considered possible to open the hole again and a pipe could be installed and raised to the drilling/grouting platform at 64 to 65 m asl. This pipe cannot be too wide, because it must be inserted in this existing hole. We assume the diameter should be in the range of 120 mm – 150 mm and on the other side, normal drilling equipment must be able to be guided through this pipe to find the old open borehole (minimum inner diameter of the pipe 110 mm).

The first step is to try to insert a grouting pipe through this auxiliary pipe down to the bottom of the clay layer and grout from there upwards lifting the grout pipe in steps. If it is not possible to bring down the pipe, the borehole must be re-drilled again through the auxiliary pipe followed by grouting.

It may be noted that the drilling method has also some risks. The drilling rig may not follow the hole over the full length, because obstacles in the spring channel cannot be excluded. If the

drilling rod does not find obstacles it may reach the bottom of the borehole and a grouting pipe can be installed. Preferably, cement mortar could be pumped into the hole beginning at the bottom to finally seal it. If the sealing is not effective, additional grout holes must be drilled around the old borehole in a grid of about 1.2 m which must be grouted from below the Silt/Clay layer.

The grouting method is not fully predictable, and in the worst case additional punching of the Silt/Clay layer may be caused. Grouting of cement/sand mortar should be used preferably.

Final Remark:

The Employer has informed us that he is in favour of the grouting solution which shall be followed by the Consultant. If this method fails finally, the installation of a well may have to be considered again.

In the meantime, NHBDC contacted the Company "Misr Raymond", which carried out the borehole B10 in the year 2000 for further information. Further clarification and research for suitable equipment together with the Contractor is ongoing.

Yours Sincerely,

For: B.R. Hein
Chief Resident Engineer

TE

cc: NHBDC-Cairo: Dr. J. Kohli, PM

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NHBDC/RGBS/L1/00396 19 September 2004

Eng. Mohammed Abd El Aal
Resident Engineer
RGBS – Site
Naga Hammadi Barrage

New Naga Hammadi Barrage and Hydropower Plant
Lot 1 – Civil Works

Subject: **Construction Pit - Spring on Level 53 m asl**

References: (1) NHBDC/RGBS/L1/00393 dated 15 September 2004
(2) NHBDC/NHBJV/L1/01495 dated 20 September 2004
(3) NHBDC/NHBJV/L1/01490 dated 13 September 2004

Dear Eng Mohammed Abd El Aal,

We refer to the above mentioned letters concerning the spring in level 53 which was encountered most probably at the old Borehole B10 from the investigation campaign on right bank in the year 2000, located in the upstream part of the Navigation Lock.

In the meantime further discussions about alternatives to solve the problem were held with the JV and their Subcontractor BAUER including a concrete plug solution placed by the drilling rig BAUER BG 15, which is at site and was used for drilling dewatering wells. This solution was compared to the grouting solution, and at the end the grouting solution was preferred by all parties including the Employer and the Consultant. The reasons were:

- Enormous earthworks to establish a working platform at about 64 m asl for the heavy well drilling rig including the ramps, whereas the small drilling rig for the drilling and grouting can be lifted by a crane to a smaller platform.
- The plug solution is restricted to the equipment at site which is able to drill only to a maximum depth of 41 m, which would mean, with this solution the bottom Silt/Clay layer cannot be reached.
- The drilling and grouting method will most probably follow the old Borehole and can be extended into the top of the Silt/Clay layer. In this case, after successful grouting, no water will feed the dewatering system inside the Construction Pit. If the drilling rig should not follow the old Borehole on the full depth, at least a plug will be established by grouting, which is considered to be safe against uplift forces.

- To install a well remains the last solution if the installation of a plug in the Borehole by grouting means should fail. It has the disadvantage that the well will feed the dewatering system and it must be controlled in a continuous manner that no fines will be washed out.

Considering all above aspects, the Consultant recommends to instruct NHBJV to re-drill and grout the old Borehole B10 with a normal drilling rig which was used before on site for exploratory drilling.

Yours Sincerely,

For: B.R. Hein
Chief Resident Engineer

TE

cc: NHBDC-Cairo: Dr. J. Kohli, PM

Received on 26/9/04 HD

NAGA HAMMADI BARRAGE DEVELOPMENT CONSULTANTS

LI Lahmeyer International
Consulting Engineers
Germany

EWE Electrowatt
Engineering
Switzerland

SOGREAH
Consultants
France

in Association with Arab Consulting Engineers, and Electrical Power System Eng. Co., Egypt

26 A, Asma Fahmy Street
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Cairo, Egypt

Tel: (02) 4185219, 4177303
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e-mail: lahmeyer@sedata.net.eg

Site Office Naga Hammadi New Barrage

Tel: (093) 840450, 840469, 840470
Fax: (093) 840451
e-mail: nhbdc@yahoo.co.uk

NHBDC/NHBJV/L1/01495

20 September 2004

Mr. Sylvestre Guillien
Project Manager
Naga Hammadi Barrage JV
Nile Hilton, Commercial Center
2nd Floor Office # 36
Al Tahrir Square, Cairo, Egypt

New Naga Hammadi Barrage and Hydropower Plant
Lot 1 – Civil Works

Subject: **Construction Pit – Grouting of Open Borehole B10**

References:
(1) NHBDC/NHBJV/L1/01490 dated 13 September 2004
(2) Meeting in Employer's Office dated 19 September 2004
(3) NHBDC/NHBJV/L1/01487 dated 13 September 2004

Dear Mr. Guillien,

We refer to the above mentioned letters (1) (3) and respective meeting held on 19 September.

Hereby, we instruct you to install the auxiliary steel pipe as per reference letter (1) and mobilize the specialized Subcontractor Geotechnical Egypt with adequate equipment to redrill and grout the old Borehole B10.

With receival of this letter the mobilization of the Subcontractor shall be completed within 5 working days. Start of work is expected latest 7 working days from this notice, as verbally discussed and agreed upon.

The Employer Consultant understand that NHBJV intends to start installation of the auxiliary pipe on 20 September 2004, 14:00 hrs. Start of work for "Geotechnical" is expected on 27/28 September 2004.

Yours Sincerely,

For: B. R. Heim
Chief Resident Engineer, NHBDC

H. El

cc: RGBS Site Eng. Mohammed Abd El Aal, RE
NHBDC Geotechn. Engineer

REC. 44/
25109

BILFINGER BERGER | VINCI CONSTRUCTION GRANDS PROJETS | ORASCOM

NAGA HAMMADI BARRAGE JV

A joint venture between Vinci Construction Grands Projets / Bilfinger Berger AG / Orascom Construction Industries

Naga Hammadi, 25 September 2004
NH01/NHBDC/C/02076

Naga Hammadi Barrage Development Consultants
26A Asma Fahmy Street,
Mirghany, Heliopolis, Cairo
Arab Republic of Egypt

Attn.: Chief Resident Engineer, B. R. Hein
Naga Hammadi Barrage Site Office

Distribution: NHBDC: Cairo 1 copy, Site 1 Original
Employer / PIU: RE 1 copy, Dep. RE 1 copy

Dear Sir,

RE.: Spring in the Navigation Locks Area.

We refer to your letter NHBDC/NHBJV/L1/01501 dated 2004-09-22 and comment as follows.

The works performed up to Thursday 2004-09-23 inclusive have induced the following costs:

- Direct costs (all as recorded by the daily reports):
  - Labour.
  - Heavy equipment for earthworks and cranage.
  - Supply of sandy gravel soil.
  - Reinforced concrete for the basement plate.
  - Steel casing to be placed in the borehole.

- Indirect Costs:
  - Site supervision (recorded by the daily reports).
  - Engineering: assistance to the Employer and Consultant to investigate possible options and mobilise the adequate resources.

- Idling Equipment:
  - To date, no idling equipment has been recorded.

The costs to be induced by the works still to be performed should be limited to:

- Direct Costs:
  - Redrilling of the borehole and grouting by Geotechnical Egypt.
  - Supply of cement for the above.
  - Removal of both the backfilled hill and casing.
  - Labour and equipment by NHBJV if needed.

Registered office & mailing address :

Vinci Construction Grands Projets / Bilfinger Berger AG / Orascom Construction Industries
77 B, El Nasr Road-Nasr City-Cairo Egypt
Tel.:+(202) 402 21 08 / + (202) 402 21 06 / + (2) 012 744 71 95
Fax: + (202) 402 17 72

- Indirect Costs:
  - Site supervision.
  - Assistance to the Employer and Consultant in case of unexpected event.

Please find attached to this letter a copy of all daily reports up to 2004-09-23 inclusive to be signed by the Employer and Consultant.

To proceed with the next stage (redrilling and grouting), your formal agreement on the following is needed:

- All daily reports issued to date to be signed and returned.
- Cost of drilling and grouting by Geotechnical Egypt is 13 160 EGP plus NHBJV overheads. This lump sum has been offered by GE based on the assumption that the drilling and grouting can be performed in a maximum of two working days. Conditions of additional work in case of difficulties (if any) will be negotiated in due time.

Please be reminded that all activities related to the plugging of this spring are done as per the Employer / Consultant instructions and must be performed under your close site supervision.

Yours faithfully,

Sylvestre Guillien
Project Manager

FG

Encl.: as above detailed (10 A4 pages).

Our new address and telephone numbers:
Nile Hilton, Commercial Center, 2nd floor,
Office No.36
Tahrir Square, Cairo, Egypt
Tel:+ (202) 579 46 91 / 579 45 11 / 579 46 10
Fax: +(202) 579 71 84

BILFINGER BERGER | VINCI CONSTRUCTION GRANDS PROJETS | ORASCOM

No.:
Date: 2004/09/23
Day: Thursday

Naga Hammadi Barrage

Water leakage in Navigation Lock area Daily report sheet

Weather:	moderated
Start Time:	7:00 AM
Finish Time:	7:00 PM

Works:

No	description of work	location
01	Backfilling in leakage location	Navigation lock area upstream
02		
03		
04		
05		
06		
07		
08		
09		
10		

Resources

	Labour by Trade	No.	Hour		Equipment	No.	Hour
1	Engineer	1	~~10~~	8	Excavator	1	~~8~~ 7
2	Supervisor	1	~~11~~	10	loader	~~4~~ 3	~~28~~ 21
3	Foreman	2	18	12	mobil crane 60ton		
4	Labour	4/10	~~110~~	40	trucks	~~15~~ 10	75 ~~70~~
5	Surveyor	1	3	1	Traylor		
6	Helper	1	3		water tank truck	1	2
7	Time keeper	1	~~11~~	3	Compactor	1	~~5~~ 3.5
8	safety	1	~~8~~	3			
9	Plumber						
10	Driver & operator	15 ~~22~~	118	10.5			

Comments:

Used 25x10m3 of sandy gravel soil (250 m3)

NHBJV representative	NHBDC representative	Employer representative
WERO+D		

BILFINGER BERGER | VINCI CONSTRUCTION GRANDS PROJETS | ORASCOM

No.:
Date: 2004/09/22
Day: Wednesday

Naga Hammadi Barrage

Water leakage in Navigation Lock area Daily report sheet

Weather: moderated
Start Time: 7:00 AM
Finish Time: 7:00 PM

Works:

No	description of work	location
01	Backfilling in leakage location	Navegation lock area upstream
02		
03		
04		
05		
06		
07		
08		
09		
10		

Resources

	Labour by Trade	No.	Hour		Equipment	No.	Hour
1	Engineer	1	12		Excavator		
2	Supervisor	~~2~~ 1	~~15~~	7.5	loader	~~5~~ 1	60 12.5
3	Foreman	1	~~12~~	12	mobil crane 60ton		
4	Labour	3	30		trucks	~~1~~ 20	220 1/2
5	Surveyor				Traylor		
6	Helper				water tank truck	1	5 3
7	Time keeper	1	~~12~~	3	Compactor	1	8 4.5
8	safety	~~1~~	~~10~~				
9	Plumber						
10	Driver & operator	~~27~~ 29	291	19 1			

Comments:

Used 24x10m3 of sandy gravel soil (240 m3)

NHBJV representative	NHBDC representative	Employer representative

BILFINGER BERGER | VINCI CONSTRUCTION GRANDS PROJETS | ORASCOM

No.:
Date: 2004/09/21-22
Day: Tuesday / Wednesday

Naga Hammadi Barrage

Water leakage in Navigation Lock area Daily report sheet

Weather: moderated
Start Time: 8:00 PM
Finish Time: 7:00 AM

Works:

No	description of work	location
01	Backfilling around leakage pipe till level +58.0	Navigation lock area upstream
02		
03		
04		
05		
06		
07		
08		
09		
10		

Resources

	Labour by Trade	No.	Hour		Equipment	No.	Hour
1	Engineer	1	4		Excavator		
2	Supervisor	2	15*		loader	1	11*
3	Foreman				crane		
4	Labour				trucks		
5	Surveyor						
6	Helper						
7	Time keeper						
8	safety						
9	Plumber						
10	Driver & operator	1	11*				

Comments:

Backfilling 15x10m3 (150m3)

* Loader & Driver waiting 7 Hours as standby for emergency with the 2 Supervisor

NHBJV representative	NHBDC representative	Employer representative

BILFINGER BERGER | VINCI CONSTRUCTION GRANDS PROJETS | ORASCOM

No.:
Date: 2004/09/21
Day: Tuesday

Naga Hammadi Barrage

Water leakage in Navigation Lock area Daily report sheet

Weather: moderated
Start Time: 7:00 AM
Finish Time: 5:00 PM

Works:

No	description of work	location
01	Excavation from level +57 till +53	Navegation lock area upstream
02	Put pipe in place from level +53 till +58.5 (6 ml)	Navigation lock area upstream
03	Put pipe in place from level +58.5 till +64.5 (6 ml)	Navigation lock area upstream
04		
05		
06		
07		
08		
09		
10		

Resources

	Labour by Trade	No.	Hour		Equipment	No.	Hour
1	Engineer	1	3	1	Excavator	1	4
2	Supervisor	1	5		loader	2	8
3	Foreman	1	5		crane	1	3 2
4	Labour	5	25		trucks	2	10
5	Surveyor	1	3				
6	Helper	2 4	12	6			
7	Time keeper	1 2	6 3				
8	safety	2	6				
9	Plumber	2	6				
10	Driver & oparator	6	25				

Comments:

Used 26x10m3 of gravel soil (260 m3)

NHBJV representative GEROLD | NHBDC representative | Employer representative

BILFINGER BERGER | VINCI CONSTRUCTION GRANDS PROJETS | ORASCOM

No.:
Date: 2004/09/16
Day: Thursday

Naga Hammadi Barrage

Water leakage in Navigation Lock area Daily report sheet

Weather: moderated
Start Time: 7:00 AM
Finish Time: 5:00 PM

Works:

No	description of work	location
01	Making acces for truks at level + 50.9	Navegation lock area upstream
02		
03		
04		
05		
06		
07		
08		
09		
10		

Resources

	Labour by Trade	No.	Hour	Equipment	No.	Hour
1	Engineer	1	1	Excavator		
2	Supervisor	2	6	loader	2	6
3	Foreman			mobil crane 60ton	1	1
4	Labour	5	15	trucks	2	6
5	Surveyor			Traylor	1	1
6	Helper			water tank truck	1	1
7	Time keeper	1	1 3	Compactor	1	1
8	safety	1	3			
9	Plumber					
10	Driver & operator	8	16			

Comments:

Used 15x10m3 of sandy gravel soil (150 m3)

NHBJV representative	NHBDC representative	Employer representative
6/8/10		

BILFINGER BERGER | VINCI CONSTRUCTION GRANDS PROJETS | ORASCOM

No.:
Date: 15/9/2004
Day: Wednesday

Naga Hammadi Barrage

Water leakage in navigation lock area Daily Record Sheet

Weather:	Moderate
Start Time:	7:00 AM
Finish Time:	5:00 PM

Works:

No	Description of work	location
01	Making acces road for crane at level 57.0	Navigation lock area upstream
02		
03		
04		
05		
06		
07		
08		
09		
10		

Resources

	Labour byTrade	No.	Hour		Equipment	No.	Hour
	Supervisor and foreman	2	3/E		Loader 950	2	3/E
	Drivers and operator	6	8		Grader	1	1
	Labor	4	3/E		Trucks	2	3/E
	Timekeeper	1	3/1		Water tank	1	1
	Safety	1	3				
	Engineer	1	1				

Comment

Material used for backfilling is sand and gravel material. Quantity used is 230 m3.

NHE/V representative	NHEDC representative	Employer representative
UEROM A		

BILFINGER BERGER | VINCI CONSTRUCTION GRANDS PROJETS | ORASCOM

No.:
Date: 11/9/2004
Day: Saturday

Naga Hammadi Barrage

Water leakage in navigation lock area Dally Record Sheet

Weather:	Moderate
Start Time:	9:30 AM
Finish Time:	5:00 PM

Works:

No	Description of work	location
01	Survey works	Navigation lock area upstream
02	Backfilling works to stop water leakage	Navigation lock area upstream
03	Making access road and plattform to place steel pipe	Navigation lock area upstream
04		
05		
06		
07		
08		
09		
10		

Resources

	Labour byTrade	No.	Hour	Equipment	No.	Hour
	Supervisor	1	4	Loader 950	1	3
	Drivers and operator	7	3/E	Excavator	2	3/E
	Labor	2	3/E	Trucks	4	2/E

Comment

Material used for backfilling is sand and gravel material. Quantity used is 150 m3.

NHEJV representative | NHBDC representative | Employer representative

BILFINGER BERGER VINCI ORASCOM

NAGA HAMMADI BARRAGE JV

Daily Report

N° :	Start	End
Day Shift:	7⁰⁰ am	11³⁰ pm
Night Shift:	pm	am

Date: 16/09/2004 Section Workshop

Department: ~~Works~~ Steel workshop

Weather ☒ sunny ☐ cloudy min/max 25 / 40 °C

Wind ☒ low ☐ middle ☐ heavy

JV Staff			Subcontractor Company Name	Subcontractor Company Activity
Position	N°	1		
Superintendent	R. Mohammed	2		
Site Engineer	BENKERT	3		

DESCRIPTION OF WORKS

Location	Task Description	Work	Team-N°	Labour JV	Labour Sub
	INSTALLATION OF 6 PIPES PIECES ø 75 mm by welding.		2	2	
	Threading of pipe pieces		2	4	
	Welding of Pipe to the Concrete block		2	5	
		Σ	2	11	

Material Deliveries

Item	Description	Quantity	Unit
1	C-channel welded on concrete block 50 mm x 4 PCS.	2	m
2	Electrodes for welding 2,5 mm /7018/ 0,5 kg.	0,5	kg.
3			
4			
5			
6			
7			
8			

TRANSPORT- and LIFTING EQUIPMENT / OTHER EQUIPMENT

Transport Lifting	JV Nos.	JV Hours	Sub Nos.	Sub Hours	Equipment	JV Nos.	JV Hours	Sub Nos.	Sub Hours	Remarks
					Welding machine LINCOLN	1	2,5			

COMMENTS / INSTRUCTIONS

LETTER NO NHBCO/NHBJV/L1/01490

Subcontractor Name and Signature:

Superintendent Name and Signature: [signature]

Section Manager Name and Signature: [signature]

BILFINGER BERGER | VINCI | DRAGOCO

NIGAHRAMO BARRAGE JV

Daily Report

N° :

	Start	End
Day Shift:	7⁰⁰ am	5⁰⁰ pm
Night Shift:	pm	am

Date: 15/09/2004 | Section: Workshop

Department: ~~Works~~ Steelworkshop

Weather ☒ sunny ☐ cloudy min/max 24 / 41 °C

Wind ☒ low ☐ middle ☐ heavy

JV Staff			Subcontractor Company Name	Subcontractor Company Activity
Position	N°	1		
Superintendent	M. Rahmouni	2		
Site Engineer	BENKERT	3		

DESCRIPTION OF WORKS

Location	Task Description	Work	Team-N°	Labour JV	Labour Sub
	WELDING TOGETHER OF 2 PIPES Ø 150mm		2	4	
	BURNING OUT OF 6 HOLES Ø 75mm		2	4	
	INSTALLATION OF 6 PIPE PICES Ø 75mm by WELDING		2	10	
		Σ	2	20	

Material Deliveries

Item	Description	Quantity	Unit
1	Steel pipe Ø 6" (150mm) 6 + 3 m	9	m
2	Steel pipe Ø 3" (75mm) 6 x 10cm	60	cm
3	Steel cap to close the holes 6 x 3"	6	pcs
4	Electrodes for welding 2,5mm / 3 Kg /Nr.7018	3	Kg
5			
6			
7			
8			

TRANSPORT- and LIFTING EQUIPMENT

Transport Lifting	JV Nos.	JV Hours	Sub Nos.	Sub Hours
HIAB	1	4		

OTHER EQUIPMENT

Equipment	JV Nos.	JV Hours	Sub Nos.	Sub Hours
Welding Machine LINCOLN	1	2		

Remarks

COMMENTS / INSTRUCTIONS

LETTER No NHB DCI NHB JV/LA P1690

Subcontractor Name and Signature:

Superintendent Name and Signature:

Section Manager Name and Signature:

BILFINGER BERGER VINCI CONSTRUCTION GRANDS PROJETS DRAGAGES

NIGHAMCO BAHRAIN W.L.L.

Daily Report

N° :

	Start	End
Day Shift:	10. am	7. pm
Night Shift:	pm	am

Date: 14 / 09 / 2004 | Section: Workshop | Department: Works

Wind: ☐ low ☐ middle ☐ heavy

Weather: ☐ sunny ☐ cloudy min/max / °C

JV Staff			Subcontractor Company Name	Subcontractor Company Activity
Position	N°	1		
Superintendent		2		
Site Engineer		3		

DESCRIPTION OF WORKS site installations (240)

Location	Task Description	Work	Team-N°	Labour JV	Labour Sub
Precast yard.	Base Concrete installations				
	1 - Carpenter.	3 Hours	3		
	1 - helper for carpenter.	3 h	3		
	1 - steel Fixer.	2 h	2		
	1 - helper for steel Fixer.	2 h	2		
	1. Concretor.	1 h	1		
	work hours 11 hours.	Σ	11 h		

Material Deliveries

Item	Description	Quantity	Unit
1	1m x 1m x 25 C.m Concrete.	1m x 1m x 25 C.m	m3
2	12 steel bar ø 16 Lengh 90 C.m.	12 steel bar	Bar
3	4 Hook ø 12 mild steel 4 x 1m = 4m.	4 Hook	Pc
4			
5			
6			
7			
8			

TRANSPORT- and LIFTING EQUIPMENT

Transport Lifting	JV Nos.	JV Hours	Sub Nos.	Sub Hours
HIAB	1	1/2		

OTHER EQUIPMENT

Equipment	JV Nos.	JV Hours	Sub Nos.	Sub Hours

Remarks

COMMENTS / INSTRUCTIONS

LETTER N°. NHBDC/NHB/V/L1/01490

Subcontractor Name and Signature:

Superintendent Name and Signature:

Section Manager Name and Signature:


2004 9 20


2004 9 20


2004 9 20


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225D LC
CAT


225D LC
CAT


AMMANN
CAT


2004 9 23


2004 9 24